FACTORING PATTERNS

$A^2 + 2AB + B^2 = (A + B)^2$

$A^2 - 2AB + B^2 = (A - B)^2$

$A^2 + B^2 = A^2 + B^2$ prime

$A^2 - B^2 = (A - B)(A + B)$ difference of two squares

$A^3 + B^3 = (A + B)(A^2 - AB + B^2)$ sum of two cubes

$A^3 - B^3 = (A - B)(A^2 + AB + B^2)$ difference of two cubes

Geometric Representation of SUM and DIFFERENCE of CUBE patterns:

$(\heartsuit^3 + \blacksquare^3) = (\heartsuit + \blacksquare)(\heartsuit^2 - \heartsuit\blacksquare + \blacksquare^2)$

$(\heartsuit^3 - \blacksquare^3) = (\heartsuit - \blacksquare)(\heartsuit^2 + \heartsuit\blacksquare + \blacksquare^2)$

EXAMPLES:

$(2x)^3 + y^3 = [(2x) + y][(2x)^2 - 2xy + y^2]$

$= (2x + y)(4x^2 - 2xy + y^2)$

$121 - R^2 = (11 - R)(11 + R)$

$27A^3 - 8B^3 =$

$(3A)^3 - (2B)^3 = [3A - 2B][(3A)^2 + (3A)(2B) + (2B)^2]$

$= (3A - 2B)(9A^2 + 6AB + 4B^2)$

$36X^2 + Y^2 =$ PRIME